phonus B stung in same manner with same results." Again, "Cockroach stung between abdominal terga." "Cricket stung in third leg, that leg became paralysed; leg removed with scissors, and the animal became quite active." "Gryllotalpa stung in one thigh, leg paralysed at once; stung in opposite thigh, same result. Other legs moving, turns over when placed on his back and crawls about. Stung now in thorax (dorsally), quite paralysed; moves jaws, but will not turn over."

I have made experiments with simple puncture for control—that is without introduction of scorpion poison. Using large insects for these experiments I obtained complete freedom from ill-effects when using simple puncture, whilst the same species of insects when punctured with introduction of scorpion poison were instantly paralysed and died in half an hour.

I also procured two small shore crabs. One I punctured between two joints of the great chela of one side; several drops of blood exuded, but they coagulated, and the crab remained well. The second I stung in the same place with scorpion's sting, squeezing it to ensure poisoning. The claw was immediately paralysed, and the crab gradually became torpid, and died in less than an hour.

III. "Supplementary Note on the Values of the Napierian Logarithms of 2, 3, 5, 7, and 10, and of the Modulus of Common Logarithms." By Professor J. C. ADAMS, M.A., F.R.S., Loundsean Professor of Astronomy and Geometry in the University of Cambridge. Received December 30, 1886.

In vol. 27 of the 'Proceedings of the Royal Society,' pp. 88—94, I have given the values of the logarithms referred to, and of the Modulus, all carried to 260 places of decimals.

These logarithms were derived from the five quantities a, b, c, d, e, which were calculated independently, where

$$a = \log\frac{10}{9},\ b = \log\frac{25}{24},\ c = \log\frac{81}{80},\ d = \log\frac{50}{49},\ \text{and}\ e = \log\frac{126}{125},$$

and a complete test of the accuracy of these latter calculations is afforded by the equation of condition

$$a - 2b + c = d + 2e.$$

In the actual case the values found for a, b, c, d, e satisfied this equation to 263 places of decimals.

Although this proved that the values of the logarithms found in the above paper had been determined with a greater degree of accuracy

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than was there claimed for them, yet I was not entirely satisfied with the result, since the calculation of the fundamental quantities had been carried to 269 places of decimals, and therefore the above-cited equation of condition showed that some errors, which I had not succeeded in tracing, had crept into the calculations so as to vitiate the results beyond the 263rd place of decimals.

Of course in working with such a large number of interminable decimals, the necessary neglect of decimals of higher orders causes an uncertainty in a few of the last decimal places, but when due care is taken, this uncertainty ought not to affect more than two or three of the last figures.

The Napierian logarithm of 10 is equal to $23a-6b+10c$, and the Modulus of common logarithms is the reciprocal of this quantity.

Since the value found for the logarithm of 10 cannot be depended upon beyond 262 places of decimals, a corresponding uncertainty will affect the value of the Modulus found from it.

In the operation of dividing unity by the assumed value of log 10, however, the quotient was carried to 282 places of decimals.

This was done for the purpose of supplying the means of correcting the value found for the Modulus, without the necessity of repeating the division, when I should have succeeded in tracing the errors of calculation alluded to above, and thus finding a value of log 10 which might be depended upon to a larger number of decimal places.

Through inadvertence, the values of the logarithms concerned, and the resulting value of the Modulus, were printed in my paper in the 'Proceedings' above referred to exactly as they resulted from the calculations, without the suppression of the decimals of higher orders, which in the case of the logarithms were uncertain, and in the case of the Modulus were known to be incorrect.

Although it was unlikely that this oversight would lead to any misapprehension as to the degree of accuracy claimed for my results in the mind of a reader of the paper itself, there might be a danger of such misapprehension if my printed results were quoted in full unaccompanied by the statement that the later decimal places were not to be depended on.

My attention has been recalled to this subject by the circumstance that in the excellent article on Logarithms which Mr. Glaisher has contributed to the new edition of the 'Encyclopædia Britannica,' he has quoted my value of the Modulus, and has given the whole of the 282 decimals as printed in the 'Proceedings of the Royal Society,' without expressly stating that this value does not claim to be accurate beyond 262 or 263 places of decimals.

I have now succeeded in tracing and correcting the errors which vitiated the later decimals in my former calculations, and have extended the computations to a few more decimal places. The computations of the fundamental logarithms a, b, c, d, e have now been carried to 276 decimal places, of which only the last two or three are uncertain.

The equation of condition, $a-2b+c=d+2e$, by which the accuracy of all this work is tested, is now satisfied to 274 places of decimals.

The parts of the several logarithms concerned which immediately follow the first 260 decimal places as already given in my paper in the 'Proceedings,' are as follows:—

a	05700 33668 72127 8
b	67972 72775 92889 4
c	42038 01732 39184 3
d	08865 93150 99834 1
e	01463 48349 12851 7

Whence $a-2b+c=$ 11792 89849 25533 3
and $d+2e=$ 11792 89849 25537 5
Difference = 4 2.

Also the corresponding parts of the logarithms which are derived from the above are—

	log 2	30070 95326 36668 7
	log 3	68975 60690 10659 1
	log 5	13580 59722 56777 3
	log 7	74183 10810 25196 7
Whence	log 10	43651 55048 93446 0

And the correction to the value of log 10 which was formerly employed in finding the Modulus is

– (263) 33 69426 01554 0

where the number within brackets denotes the number of cyphers which precede the first significant figure.

The corresponding correction of M, the Modulus of common logarithms, will be found by changing the sign of this and multiplying by M^2, the approximate value of which is

0·18861 16970 1161

Hence this correction is

(264) 6 35513 15874 7

And finally the corrected value of the Modulus is

M = ·43429 44819 03251 82765 11289 18916 60508 22943 97005 80366
65661 14453 78316 58646 49208 87077 47292 24949 33843 17483
18706 10674 47663 03733 64167 92871 58963 90656 92210 64662
81226 58521 27086 56867 03295 93370 86965 88266 88331 16360
77384 90514 28443 48666 76864 65860 85135 56148 21234 87653
43543 43573 17253 83562 21868 25

which is true, certainly to 272 and probably to 273 places of decimals.

IV. "On the Crimson Line of Phosphorescent Alumina." By WILLIAM CROOKES, F.R.S., V.P.C.S. Received December 30, 1886.

In a paper which I had the honour of communicating to the Royal Society* in March, 1879, I described the phosphorescence of alumina and its various forms when under the influence of the electrical discharge *in vacuo*, in the following words:—"Next to the diamond, alumina in the form of ruby is perhaps the most strikingly phosphorescent stone I have examined. It glows with a rich, full red; and a remarkable feature is that it is of little consequence what degree of colour the earth or stone possesses naturally, the colour of the phosphorescence is nearly the same in all cases; chemically precipitated amorphous alumina, rubies of a pale reddish-yellow, and gems of the prized 'pigeon's blood' colour, glowing alike in the vacuum, thus corroborating E. Becquerel's† results on the action of light on alumina and its compounds in the phosphoroscope. . . . . The appearance of the alumina glow in the spectroscope is remarkable. There is a faint continuous spectrum ending in the red somewhere near the line B; then a black space, and next an intensely brilliant and sharp red line, to which nearly the whole of the intensity of the coloured glow is due. . . . . This line coincides with the one described by E. Becquerel as being the most brilliant of the lines in the spectrum of the light of alumina, in its various forms, when glowing in the phosphoroscope."

In 1881‡ I again returned to the subject, describing a large number of fresh experiments; and I may add that the red glow of alumina has been, off and on, a subject of examination with me since the year first named down to the present time.

In the papers above quoted I gave as accurate measurements of the alumina line as my instrumental means would then permit. I have recently had occasion to go over these measurements again in a

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* 'Phil. Trans.,' Part 2, 1879, pp. 660, 661.

† 'Annales de Chimie et de Physique,' vol. 57, 1859, p. 50.

‡ 'Roy. Soc. Proc.,' vol. 32, pp. 206—208.